

Amendments to the Specification:

Please replace the paragraph beginning at page 3, line 13, with the following rewritten paragraph:

The invention is based on the fact that biological ~~issues~~ tissues have that kind of statistical a priori information that this information can be utilized ~~successfully~~ successfully with bayesian inversion in medical x-ray imaging. The suitable a priori information makes it possible to model the biological tissue mathematically accurately enough and independently of X-ray imaging. From biological tissue it is possible to compile ~~qualitative~~ qualitative structural information which makes it possible to utilize the bayesian method successfully to solve the problems in medical three-dimensional x-ray imaging. ~~There are~~ is a certain regularity in biological tissues and this regularity is useful especially with the bayesian method.

Please replace the paragraph beginning at page 3, line 23, with the following rewritten paragraph:

For example 10 x-ray images ~~is~~ are taken from breasts of different persons. From these x-ray images is noticed that there is much similarity in the statistical structure of the breasts between different people. In other words biological tissues and x-ray images taken from the biological tissues ~~has~~ have similar or almost similar statistical structure between different persons.

Please replace the paragraph beginning at page 8, line 4, with the following rewritten paragraph:

In figures 4A and 4B there are presented examples of parts of boundary and cracks that are visible or ~~undetectable~~ undetectable in reconstruction without a priori information. In Figure 4A there is an object 4 under imaging with an edge on the surface of the object. The edge is detectable on the leftmost position where the edge is more parallel to the direction of the X-rays. In the figure 4B there is a crack inside of the object 4. The crack is detectable in the leftmost position parallel to the angle of measurement.

Please replace the paragraph beginning at page 11, line 5, with the following rewritten paragraph:

In the first preferred embodiment of the invention the articulated arm arrangement 3 moves the X-ray source 2 to the right position. The X-radiation begins by pressing the exposure

button 12. The X-ray source 2 X-radiates the object 4, which is for example teeth of a patient. The detector 6 detects the X-radiation. The image information which is got by detecting the X-radiation is sent by communication link 16 to the computer 14. The computer comprises the software means 15 to process the image information according to the invention. There can be more than one computer 14 and also the software means 15 ~~can-situate~~ be situated in more than one computer 14. For example the first computer 14 is a computer which is used in x-ray imaging. The second computer 14 is a computer which is used in processing the image information according to the invention. It is possible to have the second computer 14 far away from the actual medical x-ray device 5. For simplicity in figure 7 is shown only one computer 14.

Please replace the paragraph beginning at page 13, line 11, with the following rewritten paragraph:

It is to be noted that formula (7) does not define a probability distribution since it does not integrate to 1. Instead, the integral diverges. However, when used in the Bayes formula (4) with a suitable likelihood distribution, the posterior distribution is integrable. The same remark concerns the ~~priors~~ prior distributions derived from (7), that is, formulae (9), (10) and (11).

Please replace the paragraph beginning at page 17, line 20, with the following rewritten paragraph:

In the first, second, third and fourth preferred embodiments of the invention the basic method steps are same as mentioned with the flow chart in figure 6. The utilizing of the invention in the second, third and fourth preferred embodiment is similar to what is described with the first preferred embodiment of the invention and elsewhere in this application except for different medical x-ray imaging applications and their differences because of different medical x-ray devices and different objects to be x-ray imaged.